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ON THE BREEDING HABITS OF THE LONG-TAILED FIELD MOUSE.

BY RICHARD M. BARRINGTON.

ABOUT the 1st of October, 1880, I noticed two Long-tailed Field Mice, *Mus sylvaticus*, sunning themselves outside a hole in one of my clover-fields. They are not uncommon here (Fassaroe, Bray). The two I observed were young ones, about twelve days old, their eyes being barely open. I caught them readily, and, probing the hole, discovered the nest about three feet from the entrance, with three other young ones in it, doubtless the offspring of the same parents. I carried the five home, and placed them in a box with wool and fine grass. Next morning they were almost dead, but recovered sufficiently in my trowsers pocket to take drops of warm milk from the end of a straw. Keeping them on the mantelpiece over the fire, and putting in my pocket occasionally before feeding, I managed to rear them and compensate for the loss of the warmth of their parent. In a few days they sucked warm milk from soaked bread, and gradually came to eat the bread itself.

They were kept in a small box with two partitions, and the box was placed in a large cage on the mantelpiece. The following memoranda are taken from my notes:—Oct. 24th, grass nest made by mice for first time, being thirty-six days ago. Nov. 1st, one mouse killed by accident in revolving wheel at end of small box. Nov. 15th, grass nest changed from one partition of small box into the other partition. Dec. 11th, nest moved



outside small box altogether into a corner of the cage. (Subsequently moved inside again.) In December and January, great gnawings at woodwork of cage, and evident anxiety to get out. Jan. 28th, another mouse killed by accident, leaving only three, one male and two females. February was a comparatively quiet month, mice becoming reconciled to cage.

Three young ones were born on the 7th or 8th of March, the mother being about five months and a half old.

Calling the females A and B, the following table shows their productive powers:—

				Interval since last litter.
March 7th or 8th. A		3 young ones.		
„	19th.	B	5 „	24 days.
„	31st.	A	3 „	29 „,
April	18th.	B	5 „	24 „,
„	24th.	A	3 „	23 „,
May	11th.	B	5 „	23 „,
„	17th.	A	4 „	23 „,
June	12th.	A (?)	4 „	26 „,
July	9th.	A (?)	4 „	27 „,

Judging from this table, the period of gestation seems to be about three weeks. I have added a mark of doubt to A in the last two instances, because being absent from home in Iceland during June and part of July, I am unable to say whether A or B was the mother of the mice born on June 12th and July 9th, but that A was the mother I have little doubt.

On my return from Iceland I found it impossible to recognise my pets; some were dead, others had escaped, and many of the young were now as large as their parents. I cannot therefore give any accurate notes subsequently, but the above table shows what two female Long-tailed Field Mice are capable of in less than five months; and had not one of the females (I have supposed B) escaped early in June the number of young would have been still larger. During April we had twelve to twenty mice, young and old, in the nest; they all slept together, and it was certainly a curious sight to see father, mothers, and children of all ages and sizes in the nest, the young of different ages suckling the same mother at the same time, and the mothers appearing to suckle each other's young indiscriminately. They also seemed to have no cessation of suckling; but on this point I will not

speak confidently. So fast did the young attach themselves that the females could scarcely move without pulling two or three after them.

The young were reared in the small box, but the mothers had a care over their movements outside, and carried them back to the nest until they reached the age of three weeks. They were not caught at the back of the neck, as is usual with dogs and cats when carrying their young, but generally by the side of the belly, midway between the fore and hind legs; the mother then raised the young one completely off the ground, and with head erect conveyed it to the nest. Sometimes the parental authority was attempted to be exercised on an "old" young one, and a species of dragging was then resorted to. The entrance to the breeding-box was narrow, and it was not possible to carry the young through it. This the mothers soon learned, and they overcame the difficulty by dropping the young one at the entrance and then, going in themselves, they turned round and dragged it in head foremost.

It has been said that *Mus sylvaticus* is easily tamed, but my pets were always timid and easily frightened. As to food, a sod of grass was put in every morning, and in this they delighted to root until the whole of it was scratched about the cage. The blades of grass were seldom eaten, the roots being much preferred, but the leaves of clover, and especially dandelion, were greatly relished, and for an unexpanded flower of dandelion nearly everything else would be deserted: the fortunate possessor of this delicacy would carry it off to a corner to be free from interruption. A tiny saucer of milk was always in the cage, and they drank it eagerly. Oats, wheat, barley, chesnuts, beech-nuts, walnuts, arbutus berries, gooseberries, apples, grapes, and, in fact, every variety of fruit was eaten. Almonds were not much liked. Every corner of the cage was a storehouse; a grain of wheat or other food would be covered up with the nose, after the manner of a dog burying a bone, and sometimes the hind legs would be used in scraping the floor of the cage backward to assist in heaping materials to hide it. The Field Mouse hides many things in the one place; I do not know that dogs have ever been known to do this.

EFFECTS OF REVERSION TO THE WILD STATE IN OUR DOMESTIC ANIMALS.*

BY HON. J. D. CATON.

A UNIFORMITY of form, colour, and habit in individuals among the various species of wild animals, is almost universally observed, and the loss of this uniformity under the influence of domestication, if less universal, is very general. How long it took to produce these changes in the Horse and the Ox, the Sheep and the Goat, we cannot know, for these were subdued to domestication before events were recorded which might tell us of the struggle. That some animals were more readily influenced by domestication than others, we know. How readily the wild Turkey changes in form, colour, and habits under the influence of domestication I have demonstrated by my own careful experiments, an account of which I gave in the 'American Naturalist' for June, 1877. That the domesticated Reindeer of Lapland have become parti-coloured, while their wild brethren of the mountains all about them retain a uniform colour, I have shown in 'The Antelope and Deer of America' (p. 330), and in 'A Summer in Norway' (p. 223). The Deer in the parks of England and Ireland have become unstable in colour, although they have been subjected to the influence of domestication for a much shorter period than have the Reindeer of Lapland. These are the most striking instances among the Quadrupeds, which occur to me, to enable us to compare the wild with the domesticated animals, although the Wild Horse and the Wild Ass are still met with in Asia, and the Wild Ox still existed in Scotland till within very recent times at least, but it may be well doubted whether the wild cattle of Scotland are the progenitors of our Domestic Ox. The domesticated Buffalo, as seen in Southern Europe and Asia, and in Northern Africa, has degenerated less both in colour and form than most other quadrupeds under domestication, and his wild habit still possesses him to a certain extent.

The Wild Boar submits to domestication with remarkable docility, and human care changes its form, colour, and habit in a very short time and in a remarkable degree. Human care,

* From the 'American Naturalist,' Dec. 1881.

by judicious selection, may fix varieties of all these domesticated animals with persistent characteristics, but immediately his supervising care is withdrawn all these peculiarities disappear.

Of the birds, perhaps the Peacock resists the influence of domestication with the most persistence, though the Guinea-fowl undergoes no perceptible change from generation to generation, with rare exceptions.

While all have had opportunity to observe the changes which have been wrought in our domesticated animals by human care and supervision, opportunities have not been so general for observing the effects upon our domesticated animals when allowed to return to the wild state. My observations lead me to the conclusion that the tendency is not only to return to the wild habit, but to the original form and colouring of the remote wild ancestor. That there is some law governing this reversion we may well believe, though we may not be able to fully understand it yet.

My own observations tend to show not only a tendency, at least in some species, to revert to the original form and colour of the wild ancestor, but they also suggest the possibility that this tendency is the strongest in those cases where the domesticated animal has most recently been reclaimed from the wild state, or in those cases where the change produced by domestication was the most rapid.

I have had the best opportunities for studying this subject in the Hawaiian Islands. With the exception of the Goose and the Duck, nearly all the animals which have been introduced into those islands since their discovery, as well as those which were then held in domestication,* have reverted to the wild state. Among these I may mention the Ox, the Horse, the Goat, the Sheep, the Hog, the Dog, the Cat, the Turkey, the Peacock, and the Barn-yard Fowl. Where I had not the opportunity of studying these personally, I spared no pains to gather the facts from the most reliable sources.

The greatest physical degeneracy was observed in the Wild Horse and the Wild Sheep. The Ox was introduced by Vancouver, less than a century since, upon the island of Kauai, from California, whence it was introduced upon the other islands. At

* They had the Hog and Common Fowl when discovered by Cook.

most it has been subject to the new influences scarcely three quarters of a century. During that time no appreciable change has taken place in the colouring of the Ox, nor much in his form, but his habit is wild and wary, fleeing from man in alarm; and he has acquired great fleetness over the lava beds in the mountainous regions which he selects for his home. While he is terrified at the approach of man, when wounded or hard pressed he becomes bold and aggressive, and is a dangerous enemy. In some parts of the islands they have become so numerous that the scarcity of sustenance has forced them down into the lower regions, where it is feared that they may destroy the forests, upon which it is supposed much of the rainfall depends. Indeed, on the island of Ouahu a large district of country was pointed out to me which was said to have been once a forest, and was now entirely destitute of arboreous vegetation. This change was attributed to the wild cattle. They are hunted for their hides alone.

I saw none of the Wild Horses or Wild Sheep, neither of which are numerous. I was told that the former are much more degenerated in size, form, and vigour than those on our western plains, which may be attributed to the want of an abundance of food adapted to their requirements in the elevated regions which they affect, but in habit they are as wild as the cattle. The Wild Sheep, which are very limited in number, and I met with few who had seen them, were small, gaunt, and long-legged, with a scant and coarse pelage.

The Wild Goats are very numerous, especially in the mountainous regions of the eastern islands. During the afternoon which I spent viewing the wonderful sights from the rim of the great extinct crater, Haleakala, I saw two bands of Wild Goats within the crater. I sat ten thousand feet above the sea. The chasm before me was seven miles across and two thousand feet deep. Its vertical walls in a few places had been partially broken down, so that bunches of grass had taken root on the shelves or steps formed in the disintegrated lava, and the Goats were clambering about, leaping from shelf to shelf, seeking food. Towards evening they descended to the floor of the crater and disappeared in its eastern arm. With the naked eye they could not be identified, although one band was directly beneath me, but a good field-glass revealed them very plainly. A large majority

were snow-white, some were parti-coloured, and one appeared to be black. Their natural capacity for climbing has no doubt been improved by their reversion to the wild state. They are very wild and cautious, and difficult of approach by the hunter. They, too, are hunted for their skins.

The most marked and rapid change is produced in the Hog by his emancipation from the restraints of domestication and the care of man. In a single generation he changes in form, colour, and habit from the staid and quiet porker to the fleet and fierce Wild Boar. The latter is the character as described to me by all who had been interested to make observations on the subject, of the numerous Wild Hogs now roaming in those islands. Colonel Charles Judd assured me that, many years before, a lot of Hogs escaped from his ranch on the easterly side of Oahu, and went into the mountain which bordered the ranch. Among them was an imported Boar. Before he could find them they had become so wild that he could not reclaim them from their mountain fastnesses. He got sight of this Boar many times during several succeeding years. He was so marked that he could readily identify him. The change in form and habit were almost immediate. He soon became wild and almost as fleet as a deer. His body became thin, his back arched, and his legs *appeared* to be much longer than when he escaped. Much slower was the change of colour, but this finally occurred to a very appreciable extent, so that in a few years he had distinctly assumed the dark sandy shade of the Wild Boar. He wisely forbore to shoot him that he might study the developments which he saw going on. In the third or fourth generation the pigs showed very distinctly the sandy shade and stripes observed on the side of the young of the Wild Boar. From these and similar observations, I should infer that it would not take very many generations, with proper care, to completely domesticate the Wild Boar.

I heard of but two places where the Pea-fowl had gone wild. The first was at the plantation of Colonel Judd, before mentioned, and the other was the plantation of Captain M'Kee, on the island of Maui, whence the birds had escaped, and gone into the mountains above. No change was observed, except that they had become wild, but not excessively so, and I did not learn that they had been much hunted in either case.

At what time the Domestic Turkey was first taken to the islands I did not learn, but probably not very long after their discovery, or certainly soon after the arrival of the first missionary, which occurred in 1820. We may safely assume that soon after some of them wandered away and reverted to the wild state, and now they are found, more or less abundant, in the forest regions of most of the islands. They have not yet become as wary and difficult of approach as are the Wild Turkeys here. The natives trap them with some success. At Haiku I found two hens in confinement, which Mr. Dickey had purchased from a native who had caught them. I studied them with great interest. They were in a large poultry-house, the front of which was closed with slats. On approaching them they showed about as much alarm as our Wild Turkey would, similarly situated. A very decided tendency was shown to revert to the colour of our Wild Turkey. The legs had already assumed a lightish colour with a pink shade, though not so brilliant as in the wild ancestor, but quite unlike the black leg of the black tame Turkey. The colour of the plumage had also undergone a marked change. The ends of the tail-feathers and of the tail-coverts had assumed a tawny or russet shade, hardly so pronounced as in our Wild Turkey, but a great departure from all tame Turkeys. My observations in domesticating the Wild Turkey show that they first degenerate in their colouring in these two points. The white bars on the wing-feathers were there, but they are not always absent on the domesticated Turkey. In form, too, a change was manifest; the legs were longer and the body was longer and more erect than in the tame bird. Altogether the tendency to revert to the form, colouring, and habit of their wild ancestors was very marked. I say their wild ancestors, for I think I showed satisfactorily, in a paper published in the 'American Naturalist' for June, 1877, that the domestic Turkey of this country is descended from our Wild Turkey.

I heard of the Barn-yard Fowl which had gone wild in several parts of the island, but I did not see any of them. I obtained the most satisfactory account from Mr. Emerson, a son of one of the early missionaries who was located at the north-west end of the island of Ouaha, where the son still resides. The domestic birds escaped from his father's place at least fifty years ago, and

occupy an extensive elevated or mountainous wooded country. They still nest on the ground, and are quite numerous, in spite of the depredations of the Wild Cats. Although he has often seen them, they are the most wild and wary of any animal he had ever attempted to approach, and he was very rarely able to shoot one. At the approach of day the whole forest would be vocal with the crowing of the cock, and, although secreted right among them, when daylight came not one could be seen, and all was as still as if nothing had ever disturbed the quiet of the wilderness. How they managed to disappear so quietly in the grey of the morning he could not explain, for he never heard them fly from their perches in the trees. They had diminished appreciably in size, and had assumed a uniform buff-colour. Now I confess that I do not know the colour of the wild bird from which our Barn-yard Fowl, or that which was common in the States sixty years ago, is descended, but if, as I have ventured to suggest, there is a tendency, when domesticated animals revert to the wild state, to return, not only to the wild habit, but to take on other peculiarities of their wild ancestors, from which they had departed under the influence of domestication, then we may infer that the original wild stock was of a buff colour.

I do not know that this subject has been deemed worthy of observation by naturalists,—at least I have not been so fortunate as to meet with any discussion of it,—but I hope an amateur may be allowed to so far depart from precedent as to make observations in out-of-the-way directions. It may be that my inclinations have too much of a practical tendency for strictly scientific studies. I study the bones but little, for practical utilitarian features interest me more.

ORNITHOLOGICAL NOTES FROM MAYO AND SLIGO.

BY ROBERT WARREN.

IF the last few winters commencing with that of 1878-9 have been remarkable for their unusual severity, the present one will be long remembered for the long continuance of stormy weather throughout the season, beginning with the fearful gale of the 14th of October—a gale that caused more destruction amongst the trees of the wooded parts of the country than had been known for

fifty years past: the wind when at its strongest blew from the N.N.W., afterwards veering round to W.S.W., scattering hay- and corn-stacks in all directions, uprooting large trees, stripping others of all their branches, leaving only the naked boles standing, and breaking short-off some eight or ten feet from the ground fir-trees of fifteen and sixteen inches in diameter.

After this gale subsided, we had a continuance of high winds all through the month and up to the 26th of November, when another terrific gale from the S.W. set in, and, as it held longer when at its height than the October gale, the damage it caused throughout the country was far more serious; for the farmers' and cottiers' houses were stripped of thatch and slates in all directions, many completely unroofed, and in some instances the walls were levelled to the ground by the fury of the storm. Along the coast the destruction of fishing-boats was greater than ever before known, for, although drawn up ashore, many were blown into the sea and lost; in other cases they were so knocked about by the wind as to be totally wrecked in the fields into which they had been blown by the gale. During the gale of the 14th of October the mercury in a Fitzroy barometer fell from $30\cdot 1^{\circ}$ to $29\cdot 1^{\circ}$, and on the night of the 26th of November from $29\cdot 3^{\circ}$ to $28\cdot 3^{\circ}$. Although these high winds blew from an easterly direction the first week of October, and for the last two weeks of that month also,—so very favourable for the flight of our winter visitors,—yet birds of all species, including game and wildfowl, were never so scarce in this locality; and I have had a similar account from those great wildfowl haunts of the Lower Shannon and Tralee Bay, which state of things goes far to prove that the effects of the three hard winters in succession had so thinned out both our residents and winter visitors that a period of some years must elapse before we can expect to see them reappear in their usual numbers.

The stormy weather sent very few rare visitors to this locality; the only species worthy of notice being a fine adult Black-tailed Godwit, shot by a young friend near Roserk Abbey on the 3rd of September; and a very beautiful specimen of the Grey Phalarope in that pretty transition stage of plumage between the young and adult: this bird was shot by Mr. Little close to his residence, on the tidal part of the Moy, on the 15th of October. On Oct. 24th I observed a little flock of five Redwings

about the hedges, feeding on haws; and their number afterwards increased to about twenty birds, which was the greatest number I saw together at any one time this season. No Fieldfares have appeared in this district as yet this season, nor have I heard of any being seen elsewhere either in Mayo or Sligo.

A pair of Missel Thrushes appeared in the town here on the 6th of November, the first of the species seen since last winter; and on the 10th of that month I saw in one of our hedges either a Willow Wren or Chiffchaff, but, though it allowed me to get very near, owing to the want of light I was unable to make out the colour of its legs; yet still I am almost certain it was the last-named bird—its mode of flight, restless flitting about the branches, peculiar movement of the wings, &c., all go far to prove that the bird was a Chiffchaff; and also at this time of the year it is more likely that the hardy Chiffchaff would be met with than the more delicate and tender Willow Wren.

A few days after meeting with the Redwings, I thought I saw some Thrushes along with them, but until December 11th I was uncertain of the fact, when I saw three fly out of a hedge—the first seen since last winter, when both these birds and Missel Thrushes were completely exterminated in the district by the effects of the long-continued frost.

I was glad to observe a pair of Golden-crested Wrens frequenting the plantations during the autumn and winter, and hope that, owing to the mildness of the weather, they will manage to keep alive until the breeding season. The three species of Tits appear to have held out pretty well. I think they are to be seen in about the same numbers as last year; but I only saw one family of Long-tailed Tits this winter. Starlings have been fearfully thinned by the past hard winters, and only little parties of from half-a-dozen to a dozen are now to be seen directing their evening flight to the roosting-places, instead of the thousands that were to be seen previous to the destructive winter of 1878-9.

On the 22nd January I was down near Bartragh in my punt, but found the few Widgeon there very wild, and almost unapproachable. I succeeded, however, in obtaining a long shot at a dozen, and picked up seven birds, and when returning I came across a pair of Long-tailed Ducks: they were very tame, allowing the punt to come within about twenty yards before rising from the water, when I knocked them down with a charge of

No. 2 from my cripple stopper. They were nice specimens, a female and a young male.

Early in September I witnessed a most interesting flight of a Peregrine Falcon at a Greenshank. I only came in for the end of the flight, when I saw the Greenshank take to the water three times, and dive to escape the stoop of the Falcon. When the Falcon soared upwards after each stoop, the Greenshank rose from the water, screaming most piteously and flying to the shore, which it at length reached, and hid amongst the stones and seaweed (the Falcon waiting a short distance off), until I came down and saved its life.

THE BIRDS OF BRECONSHIRE.

By E. CAMBRIDGE PHILLIPS,

Member of the Woolhope Naturalists' Field Club.

(Continued from p. 50.)

SKY LARK, *Alauda arvensis*.—Common. Occasionally a small flock is observed passing over, but one never sees anything like the large flocks that occur constantly on the Wiltshire and other Downs. I think we are too high and wet for them, and it must not be forgotten that, comparatively speaking, there is very little land under tillage here.

WOOD LARK, *Alauda arborea*.—Very uncommon. I have only seen it twice since I have resided here.

WAXWING, *Ampelis garrulus*.—I can only record one instance of the occurrence of this bird, and that was killed near Llanwrtyd.

TREE CREEPER, *Certhia familiaris*.—Generally scattered throughout the county. I often see it actively creeping up some fine old elms in my garden at Brecon.

NUTHATCH, *Sitta cæsia*.—This bird has been very slowly increasing for the last few years. It was formerly rare here; so much so, indeed, that I have only observed it during the last four or five years, and then occasionally. I have seen it twice in my garden, when I was attracted by its piping note. Miss Lloyd, of Llandefailog, near Brecon, who so kindly gave me the particulars of the nesting of the Hen Harrier at Nantgwilt, tells me that the Nuthatch breeds at Llandefailog, but that the old birds only reared one young one last year, and she thinks the district too cold for them.

COMMON BUNTING, *Emberiza miliaria*.—Fairly plentiful throughout the county.

REED BUNTING, *Emberiza schæniclus*.—Common, especially in the neighbourhood of Llangorse Lake, and on the banks of the canal.

YELLOW BUNTING, *Emberiza citrinella*.—Very common. The late Mr. Marsh, Rector of Sutton Benger, near Chippenham,—whose lectures on British Birds are always remembered with pleasure by those that had the privilege, as I often had, of hearing them,—used to say that the Yellow Bunting, if properly roasted between two vine leaves, was equal to, and not easily to be distinguished from, the celebrated Orlan, *E. hortulana*, so eagerly sought after by gourmets on the Continent.

CHAFFINCH, *Fringilla cælebs*.—May with truth be said to be the commonest bird we have, and the boldest. A curious variety of a uniform delicate fawn-colour, which I have had the pleasure of inspecting, was killed at Velinnewydd by Mr. Williams-Vaughan, jun., of that place.

BRAMBLING, *Fringilla montifringilla*.—Rare. I only know with certainty of a single instance of its occurrence, and that was at Cynghordy, near Llanwrtyd, on the borders of the county.

GOLDFINCH, *Fringilla carduelis*.—Very general all over the county. We are fortunately not much troubled with professional birdcatchers, with their call-birds and nets, but only by a few amateurs, so that I think this may in some way account for their numbers. I often see them both in large and small flocks, and a pair or so nest in my garden in Brecon nearly every year.

SISKIN, *Fringilla spinus*.—This bird I see occasionally during the winter, and generally moving in small flocks.

LINNET, *Linota cannabina*.—Common enough, but I think not so much so, or in such large flocks, as in England.

TWITE, *Linota flavirostris*.—Fairly distributed in the winter throughout the county.

MEALY REDPOLL, *Linota linaria*.—I am not able to say with certainty that we have this bird with us. I have not observed it; still it is so very liable to be confounded with the Common Linnet that it is very probable it occurs occasionally.

LESSER REDPOLL, *Linota rufescens*.—Not common, but still occurring in fair numbers. A station-master on one of our principal Welsh lines tells me that he catches both the Redpolls,

especially the Lesser Redpoll, in his traps when taking Goldfinches, and that he can sell the latter, but not the former. I imagine, however, that the Linnet is mistaken by him for the Mealy Redpoll. The Lesser Redpoll makes a lively little pet, but its rich markings soon vanish in confinement.

TREE SPARROW, *Passer montanus*.—Resident with us, but in no great numbers.

HOUSE SPARROW, *Passer domesticus*.—Very common, very noisy, and very impudent, as everywhere else. I think also increasing during the past few years.

GREENFINCH, *Coccothraustes chloris*.—Common throughout the county.

HAWFINCH, *Coccothraustes vulgaris*.—Very rare indeed; in fact I may almost say unknown here. I have never seen one. Mr. Roche, of Tregunter, our late high sheriff, tells me that some twenty years ago a large flock of these birds established themselves in the large trees near his house, and that they stayed there nearly the whole winter, which, if I recollect right, was a severe one. He well remembers catching numbers of them in traps and keeping them in cages, but he has not observed any since that time.

BULLFINCH, *Pyrrhula vulgaris*.—Very common. I sometimes see it in the garden, but not often, for it is, I think, a wood-loving bird.

CROSSBILL, *Loxia curvirostra*.—Very rare here now. In the winter of, I believe, 1866, they were very abundant all over the county. Some tall larch trees in my garden at Vennyvach were literally covered with them one morning. Not knowing their note I killed several, but after that I did not disturb them. One of the birds killed was a cock in splendid plumage of a bright red; another a cock of a bright yellow; whilst the rest were hens of a dull olive-green. They stayed with us for some time, but all left about January, except one hen that stayed about the place until April, when I missed her; she frequented one larch tree in particular, and was so tame that she would take no notice of any one's approach. I have often watched her within a few feet, and her mode of feeding on the seeds of the fir-cone, and indeed her actions generally, invariably reminded me of those of a parrot. I felt quite sorry when she left us to return no more. I think if she had had a mate she would have nested here. In the same

year they were equally plentiful in the adjoining county of Caermarthen.

GREEN WOODPECKER, *Picus viridis*.—Plentiful throughout the county. On the Crug, a hill near Brecon, it is common, and may often be seen on the short turf there feeding, and, if disturbed, flying with its undulating flight to the nearest tree, uttering at intervals its loud and somewhat weird cry.

GREATER SPOTTED WOODPECKER, *Picus major*.—Rare with us. I have seen it once, and once only, on one of the large elms in my garden. I also saw a very beautiful hen bird killed by Mr. Williams-Vaughan, jun., at the Skreen-on-the-Wye, his Radnorshire residence, and close to the borders of Breconshire. The cock bird flew about in loneliness for some time, and was afterwards killed, and the pair are now in that gentleman's collection. There are also several stuffed specimens in the town that have been killed at or near Brecon.

LESSER SPOTTED WOODPECKER, *Picus minor*.—Much commoner than *Picus major*, but still far from plentiful. Occasionally one pays me a visit, and I have seen it in Vennyvach Wood, and other parts of the county. Its variegated plumage of black and white makes it so attractive that one cannot fail to notice it.

WRYNECK, *Jynx torquilla*.—Not common with us, but its nest has been taken by some young friends of mine. I imagine it occurs very sparingly throughout the county, although, as a summer migrant, its numbers are of course liable to variation.

HOOPOE, *Upupa epops*.—This beautiful bird occurs only as an accidental visitor with us. I can, however, out of many reports, give two with certainty, viz., one killed at Cathedine, near Llangorse, by my friend the late Mr. David Brown, and now in the possession of Mr. David Thomas of this town, and another killed some years since at Frwdgrehch, near Brecon. The former had a beautiful crest, but the latter, when I saw it, was either very badly stuffed or was in bad plumage when killed.

CUCKOO, *Cuculus canorus*.—Very common. Last year one frequented my garden, where, as the gardener expressed it, it "sang lovely."

KINGFISHER, *Alcedo ispida*.—Fairly numerous on the Usk and Wye and on the Brecon Canal, but certainly decreasing during the last two or three years. It is only occasionally seen on the mountain streams, and I think that it prefers slow-running water.

It is very susceptible of cold. Looking one frosty day over the Honddu Bridge, near the Castle, in this town, I saw close by the houses a Kingfisher perched, like a dull emerald ball, on a willow by the slack water that turns the mill. Repeated stones failed to move him, but at last he seemed to wake up, and, showing all his beautiful colours of blue and orange, he flew a few yards farther on, when he pitched again, and positively refused to move, he seemed so perished with the cold; and so we left him master of the situation. May not the coldness of this climate account for their not increasing faster here, for I think they are seldom if ever molested?

THE SWALLOW, *Hirundo rustica*; MARTIN, *H. urbica*; SAND MARTIN, *H. riparia*; and SWIFT, *Cypselus apus*, are very common here; in fact, I see no difference between their numbers here and in England. The Sand Martins occur in numbers on the banks of the Usk. My boys tell me that if you take a young Sand Martin from its hole, and place it at the mouth of another hole, it will not move; but place it at the mouth of the hole in which it has been hatched, and it will scuttle out of sight directly.

NIGHTJAR, *Caprimulgus europaeus*.—Common on all our heathy hills. Many a time have I had it brought to me as a great rarity, and as often have I totally failed in impressing on my visitor that, if he only watched "between the lights," he might see them almost any summer evening. How well I recollect my first introduction to this bird. Many years since, alas! in an old country seat in Wiltshire, where I have spent many happy days, I took my gun one summer evening, and, followed by old "Sahib," the retriever, I started to get a rabbit. Passing through the small park and down by the "Ladies' Well," I came to a field almost surrounded by woods. It was twilight, and all was still, save the tinkling of the distant sheep-bells on the Cherhill Down, and the faint ringing of the many chimes borne from the hills of the "White Horse." No rabbits were out, so "Sahib" and I watched and waited, until at last an old doe cautiously appeared and began distrustfully to feed; then a little hedgehog came out, working about with his nose in the grass in a wonderful way. All at once the old rabbit stopped feeding, the hedgehog seemed inclined to roll himself up, and old "Sahib" pricked his ears, as, with a splendid swift-like rush, gliding noiselessly through the air, a bird

came circling by; a minute more and I heard its curious jarring cry, and forgot everything else in watching with a delight that comes back to me, even now, the beautiful and fairy-like flight of the Nightjar.

WOOD PIGEON, *Columba palumbus*.—Very plentiful, but the large flocks one constantly meets with in the winter must be visitors from other counties, probably Herefordshire, where it breeds in great numbers. I think this bird is certainly on the increase here during the last few years, both as regards residents as well as visitors.

STOCK DOVE, *Columba ænas*.—Certainly rare with us; I have never killed but one, and that was when waiting to shoot Wood Pigeons as they came in to roost in a wood on the confines of the county. I recognised it by its smaller size, and, on killing it, found it to be a veritable *Columba ænas*. The keeper with me said there was a pair of them, but that they were very uncommon; it is, however, common in the adjoining county of Hereford.

ROCK DOVE, *Columba livia*.—In many places fairly plentiful. Mr. Crawshay has killed two in a stone-quarry near Cyfarthfa, just over, if not actually in, the county, and in the curious Aberedw Rocks, on the Wye, they breed in tolerable numbers. These rocks crop up in various turretted shapes on the Breconshire and Radnorshire sides of the river, more especially on the latter, and the Rock Doves constantly cross to and fro with arrow-like flight; they feed in the daytime on the various corn and stubble fields near, but are, of all the *Columbidæ*, the most difficult of approach and the most difficult to shoot. Indeed, the quantity of shot this bird will carry away almost surpasses belief.

TURTLE DOVE, *Turtur auritus*.—A summer visitant, but in spare numbers. The only place in the county where I usually notice it with any certainty is on the large flat tract of land between Three Cocks and Boughrood part of the Dderw Farm, the property of Lord Tredegar.

PHEASANT, *Phasianus colchicus*.—I cannot say when the Pheasant was introduced into Wales, but probably it soon spread from the large woods of Herefordshire until it established itself in the Great Forest of Brecon. It seems to do very well here, bearing severe cold with impunity. The largest Pheasant I have ever seen was a cock of the old-fashioned *colchicus* type, killed in 1879 in Lord Hereford's preserves at Tregoyd, by my friend the

Rev. John Bowen, the Vicar of Talgarth; it weighed 3 lbs. 10 ozs., and measured 2 ft. 10½ ins. from tip of beak to tail; it was a very old bird. The Chinese *torquatus*, with the white ring round the neck, is of comparatively recent introduction here, and is invariably smaller. Many white and pied birds have been killed in different parts of the county, at Clyro, and elsewhere. A beautiful pied hen, an old bird, was killed near here during the past season. Indeed, of all the game birds, there is none that seems so peculiarly liable to sport white feathers, either in a greater or less degree, than the Pheasant. I fancy that the reason is partly that no fresh blood is introduced. On the other hand, my father had in an aviary at Chippenham, Wilts, a pure white cock Pheasant and two pure white hens, as well as a parti-coloured hen, all of good size and strength.

BLACK GROUSE, *Tetrao tetrix*.—Has always existed in this county, and I am glad to say, in spite of repeated thinnings, has—thanks to a few spirited landowners—considerably increased during the past ten years. Last season (1881) several brace were killed in one day on the Marquis of Camden's property, near Trecastle. Mr. Dillwyn Llewellyn also has a few; and on Lord Tredegar's, Sir Joseph Bailey's, and Mr. Williams-Vaughan's hills there is a fair stock of breeding birds. What a pity that they cannot have one year's jubilee awarded them in this county, for its wet-bottomed woods of alder and birch bordering our heathy hills are in every respect exactly suited to their habits; and their beauty as game birds must be appreciated by every true sportsman.

RED GROUSE, *Tetrao scoticus*.—Still fairly plentiful on our heather-covered hills, and, for the reasons mentioned in the last paragraph, greatly increasing of late years. On the Eppynt Hills, Mr. Dillwyn Llewellyn and another gun killed, to the best of my recollection, fifteen brace on the first day of the past season (1881); but his hill is a very extensive one, and he is too good a naturalist and sportsman to kill them down too closely. The same remark applies to Sir Joseph Bailey, Mr. Williams-Vaughan, and Mr. Butler, who have a fair stock. On the hills between Devynnock and Penwyllt the Grouse have greatly increased, and where a few years ago one could only see four or five birds, one may now see several flocks. On one of these hills, in 1880, I and another gun killed five brace in September after the usual Grouse-shooting had

taken place ; and I am told this year they are more plentiful still, such are the excellent effects of a little preservation. I omitted to add that Grouse are plentiful on Lord Tredegar's excellently-preserved manor near the 'Storey Arms.'

GREY PARTRIDGE, *Perdix cinerea*.—Still common, I am happy to say, although materially decreased in numbers during the past few years ; wet seasons have played sad havoc with them, and they have also, I think, been shot down much too closely in various localities. This should not be, as a better Partridge country than that round Brecon it is almost impossible to conceive.

RED-LEGGED PARTRIDGE, *Perdix rufa*.—Almost unknown. About six or seven years ago a young bird was killed at Scethrog, near Brecon, by Mr. Williams, of Manest, in a turnip-field. About six months afterwards, a gentleman living in Ashbrook Place, Brecon, on going into his garden, saw something running along the ground, and, it being late in the evening, he succeeded in catching it, and sent for a well known sportsman to look at it ; he at once pronounced it to be a Red-legged Partridge, in excellent plumage, and no doubt a bird bred in the county ; it lived for four or five days, but its extreme wildness caused its death. He afterwards related the circumstance to me. Mr. Williams thinks that Mr. Alfred Crawshay, of Talybont, turned out a couple of Red-legged Partridges about a year previously, and that they must have hatched a small brood. In the autumn following, he believes, there were four or five young ones, and surmises that the bird he shot and also the one caught in Brecon were two of them ; the remainder were not seen afterwards. Mr. Williams is an indefatigable sportsman, and has shot over the greater part of the county for the last thirty years ; and these are the only two he has ever seen or heard of as being killed ; it justifies my including it, however, in my list of the birds of our county.

QUAIL, *Coturnix vulgaris*.—An occasional visitor. A friend of mine, shooting near Brecon some years since, flushed a small bevy when Partridge-shooting, but thought at first they were "squeakers" ; he, however, followed them up, and killed three of them. At another time I saw a single bird on the hill near Devynnock, and another was killed not far from Llanwrtyd, at Cynghordy, by that excellent sportsman, the late Mr. Henry Gwynne-Vaughan. Mr. Williams-Vaughan, jun., also saw three

or four near Trebarried a few years since, but, after flushing them once, failed to rise them a second time; and Sir J. Bailey also has kindly sent me word that once he shot two brace of Quail at or near Glenusk Park. Mr. Williams tells me that they were more plentiful here during the Franco-Prussian War than in any other season, and suggests that the constant firing which occurred at that time in France drove them over; he then killed several brace. Last year, I am informed, a brace of Quail nested near Bolgoed, Brecon, but did not hatch, in consequence, I imagine, of their being disturbed. I believe my friend Major Morgan, of Bolgoed, has one of the eggs. From the above, it will be seen that they are still somewhat uncommon with us.

(To be continued.)

SNAKES VENOMOUS AND NON-VENOMOUS.

BY ARTHUR STRADLING, C.M.Z.S.

"How can one tell a snake which is poisonous from one which is harmless?" is a question often asked by people who, on being censured for killing an innocuous reptile, aver that through a lack of knowing one kind from the other they have destroyed it, lest it *might have* proved dangerous.

It is to be feared that no general rule can be laid down whereby a snake's nature may be ascertained from its external characteristics, except, of course, those which lead to the recognition of the *individual species*, which would imply a considerable amount of familiarity with them. This is to be deplored, since there is no creature more absolutely inoffensive than a non-poisonous snake; even the huge constrictors very rarely meddle with human affairs, or molest man and his belongings; while the smaller genera do positive and appreciable service to him. Our common English Ringed Snake is a great devourer of slugs, which it will eat at all times in preference to frogs; and—in captivity, at any rate—will take earthworms, caterpillars, and snails. In this country, where we have practically but two Ophidians, there is no need of any universal principles of distinction, since the difference between the two reptiles is so broad; the strongly-marked black and yellow collar should alone be enough to distinguish the harmless Ringed Snake

at a glance from the Viper, which possesses the further characteristic of well defined lozenge-shaped markings which run down the whole length of the back. Perhaps the popular idea that the Viper is characterised by a V on its head may actually have much to do with the indiscriminate slaughter of both. It does not require a very vivid imagination to trace a V-shaped mark among the lines and plates on any snake's head; and the bright yellow and black blotches, to which allusion has just been made as forming a kind of collar at the back of the head in *Tropidonotus natrix*, joining at an acute angle, constitute a much closer resemblance to the letter than the irregular star-shaped patch on the "forehead" of the Viper. There is a third snake occasionally found in Great Britain—*Coronella lœvis*, but this might excusably be mistaken for the Adder. It is found more frequently in the New Forest than anywhere else; and, though certainly uncommon, is possibly not so rare as it is supposed to be. A gentleman in that neighbourhood, who offers a reward for every Viper killed, sent me several "doubtful cases" last summer, which proved to be *Coronellæ*. The harmless Slow-worm, *Anguis fragilis*, holds an intermediate place between the Ophidians and the typical Saurians.

The words "snake" and "serpent" I use indiscriminately, since their import is the same. It would be very convenient, however, if by common acceptation the venomous species might be ranged under one term and non-venomous under the other. In some parts of the world this is so, "serpent" being usually understood as designating the noxious species; in others, the term is limited to Pythons, Anacondas, and allied families; here, both have the same signification, though I remember an article in one of the magazines some years ago, which bore the heading, "Serpents and Venomous Snakes."

The wide-spread notion that all venomous snakes have flat heads—and, conversely, that all flat-headed ones are venomous—is undoubtedly a most erroneous one. Take all the Boas and Pythons, for instance: all with flattened, pointed, and (with the single exception of one Tree-boa, *Epicrates cenchris*) triangular heads. That of the Anaconda, too, is flat, but more rounded in outline; so is the Dalmatian *Elaphis*, the largest European Snake; so are certain species of *Zamensis*, *Dromicus*, *Dipsas*, and numerous other *Colubrinæ*. On the other hand, many Vipers and most of the *Elapidæ* have rounded, convex, or even bulbous heads,

the beautiful Coral Snake or Chequered Elaps (*E. lemniscatus*) being a striking example. Nor would a diametrically opposite test hold good, as occasionally happens where popular theories are in question. The majority of the Colubers are round-headed, while all the *Crotalidæ* are exceedingly flat and angular; some Vipers, as the River-jack (*Vipera rhinoceros*), the Nose-horned Viper (*V. nasicornis*), and a species of *Causus* are flattened and three-cornered as well, but slope with a curious sort of pyramidal declension from the median line to the margin. There are flat-headed snakes and round-headed snakes of both kinds, but between the extremes we find every possible gradation; besides, as we shall see presently, some are much flatter at times than they usually are.

Brilliancy of colour is accepted by many people as an indication of the baneful character of the reptile, but this is equally fallacious; indeed, though no approach to a rule can be laid down, I think it is quite the other way in the greater number of cases. Many deadly or dangerous serpents are certainly of very brilliant hue; the two African Vipers, above quoted, the Curucueu or Bushmaster (*Lachesis mutus*), the Death-adder (*Pseudechis porphyriacus*) of Australia, and Blue Viper (*Bungarus lineatus*)—so-called—of India, the Coral Snake, and most of the others belonging to the *Elapidæ*, may be cited as examples. But there is nothing very gorgeous about the Cobradi-capello, or Hamadryad, or Carpet-viper; while the large group of Rattlesnakes, the Water-viper, Copper-head, Fer-de-lance, Jararaca, Vibora-de-la-cruz, and other *Crotalidæ*, have not a bright tint amongst them. The Viper of the British Islands varies from dull brown to black. Then look at the vast number of innocuous species which present almost every colour of the rainbow in all degrees of intensity. What can rival the vivid green of *Philodryas viridissimus*, the blood-red upper surface of *Scytale coronatum*, or the vermillion, yellow, white, and black of *Oxyrhopus formosus*, *trigeminus*, *doliatus*, and *petolarius*? or the variegated pattern of *Pelophilus madagascarensis*, or even the Common Boa, which Laurenti named *Constrictor formosissimus*? Hundreds of other specimens might be instanced. Some—such as D'Orbigny's *Heterodon*—are dark on the back, but beautifully marked underneath; others again, though uniformly dark in tint, glow with a most brilliant metallic lustre, as the plumbeous and pointed

Tree-snakes. The South-American Rat-snake (*Spilotes variabilis*) presents a shining black, barred with brightest yellow, and the East-Indian *Coryphodon blumenbachii* glistens like silver.

It is difficult to see how or why an idea should have originated that all those having short or blunt tails belong to the dangerous class. No basis whatever exists for such a dictum; unless it be that in many tropical countries a great horror prevails of certain creatures which are reputed to be fearfully venomous, and which certainly have such very blunt tails that they are often known as Two-headed Snakes, being accredited with a head at either extremity, and the power of going ahead and astern with equal facility when burrowing in the earth or mud in which they are found. These really are not snakes at all, but *Amphisbaenæ*, and perfectly incapable of doing any mischief. A thick upper jaw looks bad, but is not to be trusted as a universal indication of danger.

All snakes which wear any peculiar external appendages may certainly be looked upon with well-grounded suspicion, but these are comparatively so few in number that such appendages can be regarded in this light as little more than distinguishing marks of certain species. I am not aware that there are any harmless horned snakes, though there are some which have something or other analogous to such an ornament—for instance, the *Dryiophidæ*, with their elongated, pointed snouts, and the Heterodons, in which the rostral shield is thickened into a prominent, recurved trihedral pyramid. A horny or bony appendage to the tail should also put us on our guard, whether it assumes the form of the rattle belonging to the many different genera of Rattlesnakes, or the claw-like termination of the Curucueu, or the Lance-headed Snakes. Of less diagnostic value is the possession of an expansile hood—though, naturally, in all these cases we should be guided according to the country in which we happen to be at the time, and the reptiles we may expect to meet there. The Indian and Egyptian Cobras, and the Hamadryad are the hooded snakes of common notoriety, but there are other less celebrated ones in which the dilatation is not so well-marked; nor is this characteristic confined to poisonous ones. The Caninana (*Spilotes pæcilstoma*) of Brazil hisses, rears its head, and spreads a very respectable hood when angry. The word "hood," however, hardly conveys a correct impression of the appearance to anyone who has never witnessed the action; "fins"

might do so more appropriately. The phenomenon is really due to the antero-posterior flattening of the neck—if we may speak of a snake's neck, for in anatomical law it has none; this flattening is brought about by the extension of the ribs: these being extremely mobile in their articulation with the vertebræ, and not fastened down to any breast-bone underneath, admit of being drawn out at right angles to the spine, stretching the skin and subjacent soft tissues to a corresponding extent. But this power is actually limited in the specially-noted "hooded" snakes in comparison to what it is in many others which flatten their whole bodies, throughout the entire length to which the sides are supported by ribs, in the same way! All snakes, indeed, possess this faculty in some degree; but striking examples of it are afforded by the Puff-adder (*Vipera arietans*), *Liophis merremi*, and, perhaps above all, by the Leaf-marked Snake (*Xenodon rhabdocephalus*). This last not only flattens its diamond-patterned body until it becomes a mere ribbon, with the back-bone visibly jutting up in the middle line, and possibly a recently-swallowed frog sticking out like a tumour, but positively expands its normally convex head in like manner; so that the whole animal looks as if a cart-wheel had passed over it longitudinally. This hideous habit combined with its decidedly truculent aspect have given it a bad reputation, and, in some places, the name of "Spreading Viper," though it is quite harmless.

In the absence, then, of any outward and visible sign to lead us to infer with certainty the presence or absence of the death-dealing teeth, there is only one way of making sure on the point; and that is, to open the snake's mouth and see if they are there. Nor need anyone be alarmed at the idea of doing this; it is by no means difficult or dangerous. If a serpent be held firmly behind the head—whether gripped in the hand, or pressed forcibly on the ground with the foot, or held by a loop of string or tape rove through an eye in the end of a stick (which is the very best and safest way of catching them)—it will open its jaws of its own accord and keep them widely distended in its efforts to bite, and a deliberate inspection of the interior of the mouth may thus be obtained. Perhaps an exception to this should be made in favour of our common Ringed Snake, which, as far as I have seen and heard, can never be induced to bite. Serpents allied to the Viper and Rattlesnake have movable fangs, which will be seen to

become erect, webbed to the gums by a fold of mucous membrane, or they may be brought down by drawing a pencil along the teeth from behind forwards; the *Elapidae* have fixed fangs, permanently erect. All snakes have ordinary teeth, of course—very long and sharp ones, too, sometimes.

Is this test absolutely infallible after all? One would feel inclined to say that ocular demonstration must bring conviction; nevertheless, our eyes deceive us at times when peculiar combinations of appearances favour the cheat, and we must allow that even in this there are certain circumstances under which the apparent visibility of fangs may be misleading. It is well known that some innocuous snakes have a long, fang-like tooth, standing apart from the rest, though destitute of any vestige of a poison-sac or duct. Such a thing might by itself easily give rise to mistakes. But Miss Hopley has recently pointed out the remarkable fact that these teeth are erectile, like viperine fangs, in a species which has already been mentioned, *Xenodon rhabdocephalus*. Under the circumstances, a correct diagnosis could only be arrived at (supposing the specimen to be unknown) by an accurate knowledge of the proper position of true fangs; or—still more certainly, but less to be recommended—by the crucial experiment of allowing the reptile to bite.

OCCASIONAL NOTES.

WILD CAT IN ASSYNT.—I have had presented to me from Scotland an unusually fine specimen of the genuine Wild Cat. It is an old male, with the teeth blunted from age, and one of the canines broken short off. The following is the account given of it by my brother-in-law, the Rev. Geoffrey Hill, who sent it to me:—"In the first week of May, 1879, I was passing through the parish of Assynt, in Sutherlandshire, when I met one of the game-keepers on the Duke of Sutherland's estate. I asked him whether he had trapped any cats during the winter. He said he had caught but one, and that he had the skin of it in his house. I bought it of him, and he promised to let me have the next cat that he killed. I had not been in Edinburgh more than a day or two when I received a letter from him telling me that the very morning after he saw me he had succeeded in trapping the finest cat he had ever caught: this he sent me. During my

conversation with him he told me that cats were some years ago much more numerous than at present—that, in fact, they were now becoming scarce; and this is natural, for he sets traps for them assiduously every winter, and besides this there are now four gamekeepers for the same tract of country for which some few years ago there was only one. He himself, he told me, trapped eighteen cats during his first winter—that is, fifteen years before; and the innkeeper of the place, who was the gamekeeper before the present one, told me that he had trapped sixteen cats in a fortnight, but that was, he said, some thirty years ago. The innkeeper also told me that he was the first gamekeeper appointed to that part of Sutherlandshire. Before his time no persistent efforts were made to exterminate cats, but there was a class of men called ‘fox-hunters,’—or ‘hunt-foxers,’ as I once heard them termed by a man who spoke little more than his native Gaelic,—corresponding to the English vermin-catchers, who were employed by the farmers to keep down the number of cats when they became troublesome. I was told by this innkeeper that the male Wild Cats paired with the female domestic cats, and that he had had in his house kittens which were a cross between the wild and the domestic breed.” The keeper, my brother adds, had great difficulty in killing this cat while in the trap, and it seriously injured the dog which he had with him.—ARTHUR P. MORRES (Britford Vicarage, Salisbury).

MARTEN CAT IN NORFOLK.—I should like to mention the capture of one of these animals, which I believe has not hitherto been recorded. It was trapped by a former keeper of ours, on Kelling Heath, in 1864. The specimen is an old female, and is I believe the last but one that was killed in Norfolk. It was stuffed by Travis, of Saffron Walden. Length about eighteen inches and a-half, tail about ten inches and bushy, throat yellowish white, ears large and erect. I saw a Badger, in the flesh, which was caught in a rabbit-trap on Winterton Warren, between 1869 and 1874, but cannot remember the exact year. Otters are still fairly numerous in the Broad district. A pair which nested in the boat-house on the island in Somerton Broad had two young ones of a distinctly different shade of colour, one much darker than the other. Is this a general sexual distinction in the garb of the young of this quadruped?—M. C. H. BIRD (The Vicarage, Canvey Island, South Benfleet.)

[The last Marten taken in Norfolk, we presume, was that recorded by Mr. F. Norgate (Zool. 1879, p. 171) as having been killed in the parish of Havingham, in the summer of 1878.—ED.]

THE BADGER IN OXFORDSHIRE.—Notwithstanding great persecution, the Badger is still not very uncommon in North Oxfordshire and the adjoining parts of the counties of Northampton and Warwick. A taxidermist in this town has, during the past year, preserved no less than ten specimens,

and, I am sorry to say, I have heard of several others having been killed during the same period. They breed regularly on the small remaining portion of Todmorden Heath, about six miles from Banbury. I am informed that one of the largest of those procured weighed forty pounds; this was late in autumn, when they would of course be very fat.—OLIVER V. APLIN (Banbury, Oxon).

THE WHISKERED BAT (*Vespertilio mystacinus*, Leisler), IN YORKSHIRE.—I have had the pleasure of adding this species to the Yorkshire list of mammals, three specimens, from three different localities, having passed through my hands within the last nine months. The first, from Great Mytton in Ribblesdale, is recorded in the 'Handbook of the Vertebrate Fauna of Yorkshire.' A second was shot near Harrogate, in August, 1881, by Mr. John Grange; and I have just received a third in the flesh from Mr. James Ingleby, of Eavestone, near Ripon, who found it in a cavern near that place, which is a favourite haunt of bats. He tells me that it was the only one he found in the cave on his last visit, and that it is quite new to his neighbourhood, he not having seen one of the species before. Of other bats, the Noctule, the Pipistrelle, and the Long-eared Bat are all of more or less common occurrence, and generally distributed throughout the county, and the wonder to me in the case of the Noctule is, considering its wide diffusion over Yorkshire, even as far north as Whitby and Northallerton, that it should not be known to inhabit the counties of Durham and Northumberland. None of my correspondents have as yet been able to ascertain that Daubenton's Bat (which, judging from Bell's 'British Quadrupeds,' is extremely likely to be found) occurs in the county of York. I have indeed had it reported, but no specimens have been forthcoming.—WM. DENISON ROEBUCK (Sunny Bank, Leeds)

BOTTLE-NOSED DOLPHIN IN THE COLNE.—On March 12th two Dolphins were observed in this river, near Wyvenhoe Wood, and, after several attempts, one, a female, was shot. On examination she proved to be of the Bottle-nosed species, *Delphinus tursio*. She was seven feet six inches in length to the bifurcation of the tail. Examinations of captured Porpoises would probably show that this species is not nearly so rare as is generally supposed.—HENRY LAVER (Colchester).

ALBINO GROUSE IN MAYO.—From my friend Mr. J. H. Scott, of Ballina, I have received (as a loan for our museum), a very singular variety of Grouse. It is a female bird, shot early last December, on a moor called Lugnalettin, near Ballycastle, on the borders of Erris, and was killed by Mr. A. Malley, when shooting on the moor which belongs to Mr. Scott. The bird is very pale in the general markings, and the quills are much paler than usual.

Not having ever seen or heard of such a variety, I sent the skin to Professor Newton, of Cambridge, who identified it as an uncommon variety of the Grouse, which he has seen from several localities in Scotland; but hitherto this form has not been recognised in Ireland. It is, as I learn from Professor Newton, the variety entered as "*persicus*," in Gray's 'Hand-list,' having been first described by Mr. G. R. Gray, under this strange name, through some misapprehension of its patria. Our museum is fortunate in holding possession, though only on loan, of so rare and interesting a specimen. Would that all Irish naturalists would follow the liberal example of Mr. Scott, and we should soon have before the public all the rarities as they occur.—A. G. MORE (Curator of the Dublin Natural History Museum.)

GREAT GREY SHRIKE IN DEVON.—Early in March an immature specimen of the Great Grey Shrike was brought to me in the flesh. It was shot at Morchard Bishop, in North Devon, about thirteen miles N.W. of Exeter. The only other instances of the occurrence of this Shrike in this county that are known to me are as follows:—One at Topsham, 1839 (F. W. L. Ross); one at Exeter, 1845 (Dr. W. R. Scott); one at Torquay, July, 1865 (R. Cumming); one near Honiton, January, 1871; and one between Lydford and Bridestowe, November 15th, 1876 (J. Gatcombe).—W. S. M. D'URBAN (Albert Memorial Museum, Exeter).

GREAT GREY SHRIKE IN BRECONSHIRE.—I am indebted to Mr. Roche, of Tregunter, our present high sheriff, for the particulars regarding the occurrence of this rare visitor; it was seen both by himself and his brother at Tredustan, near Tregunter, in November last, and was at once recognised, Mr. Roche having often seen the Great Grey Shrike on the Continent.—E. CAMBRIDGE PHILLIPS (Brecon, S. Wales).

GREAT GREY SHRIKE NEAR BARNSLEY.—On January 7th I saw, in the hands of a bird-stuffer of this town, a fine specimen of the Great Gray Shrike (*Lanius excubitor*), which had been shot the day before "while chasing insects." It is a rare winter visitor to this neighbourhood. In Mr. T. Lister's paper on the 'Birds of the Barnsley and South Yorkshire District,' six occurrences only of this bird are noted near here since 1831, none of which are of recent date. The Snow Bunting has been observed here this winter, though in less numbers than last year; only three specimens have, I believe, been reported, one of which was in winter plumage.—W.M. E. BRADY (1, Queen Street, Barnsley).

NOTES ON BIRDS IN NOTTINGHAMSHIRE.—During the past autumn and winter very few birds of the rarer kinds have come under my notice. I may mention the following:—An Osprey was killed in October last at Clawson; a Peregrine stayed about the woods here for a week, and I could have shot

it had I been so disposed: I saw another—perhaps the same bird—on the 26th February. Two or three Rough-legged Buzzards were seen during the autumn, and a Buffon's Skua was shot near Ollerton in November; a Long-tailed Duck was also obtained during that month on the Trent near Nottingham, and a Gadwall was sent to a Nottingham birdstuffer from Lincolnshire. I purchased of Stanley, a naturalist at Nottingham, a beautiful specimen of the Bee-eater, which was shot in July, 1879, in a pea-field at Ingoldsby, near Bowes, in Lincolnshire: though three years back, so rare a bird is worth recording. This has been one of the best partridge seasons and the worst wildfowl winters I have ever known.—
J. WHITAKER (Rainworth Lodge, near Mansfield).

VARIETY OF THE COMMON SNIPE.—Some time ago Mr. Vingoe forwarded me a Snipe from Penzance, which he claims to be a distinct species. He tells me he has obtained more than thirty examples in his neighbourhood, that sportsmen of the locality are now well acquainted with it, and many have been sent him for preservation. The peculiarity of this Snipe consists in its tail, which is much longer than that of the Common Snipe, and is square instead of rounded; it is also a somewhat smaller bird. The length of tail in the Common Snipe is two inches and two-eighths; in Vingoe's Snipe the tail is two inches and five-eighths, the two outer tail-feathers being longer than the next adjoining. Some time ago a Snipe answering this description was termed *Scolopax Brehni*, and after a time was considered to be merely a Common Snipe with the central feathers not fully grown in the tail. This explanation, however, will hardly do for the Penzance birds, as it would require their tails to develope into full an inch more than the average length of tail in the Common Snipe. I do not myself regard this variation in the tail-feathers as of specific value, and probably many long-tailed Snipes have been shot and pocketed elsewhere without notice; only, if they are as plentiful in other localities as they appear to be about Penzance, they must constitute a numerous race.—
MURRAY A. MATHEW (Stonehall, Wolf's Castle, Pembrokeshire).

THE "CHURRING" OF THE NUTHATCH.—The idea of the noise called by Mr. J. Young "churring" (p. 113), being caused by the Nuthatch is quite new to me. Nuthatches are numerous here, and the Small Spotted Woodpecker not infrequent. I have on several occasions (after watching with great care) seen the latter in the act of causing this noise, during which the head vibrated with great rapidity, and (as I believed then, though I am told by others that it is not so) apparently causing the noise by the rapid beating of its beak against the hard dead spur of a broken limb of the tree. Before I traced the noise unmistakably to the Woodpecker, I could easily have persuaded myself that it was caused by any bird on which my eye happened to light, in the immediate neighbourhood whence the noise

appeared to come. The sound is undoubtedly ventriloquial (therefore probably not caused by vibration of the beak upon the tree), and it appears to come from any spot to which the eye or attention is called by other circumstances. On one occasion a friend of mine was watching with me, while the noise was going on with great force and distinctness, apparently somewhere in a tree close to us, at one moment in one spot, and then in another ; just then a Tree-creeper caught our eyes, and at once we both exclaimed, " That is the bird!" and it was not until the Creeper had gone quite away, while the noise still continued, that we felt we were mistaken. I would ask whether Mr. Young may not have thus groundlessly credited the Nuthatch with this noise.—O. P. CAMBRIDGE (Bloxworth).

ABNORMALLY COLOURED BIRDS IN NOTTINGHAMSHIRE.—I have noticed the following varieties in this neighbourhood :—A cream-coloured Yellowhammer, with the markings of a sandy red colour, also a light yellow-coloured bird of the same species ; the former is in my possession, but not the latter. There are also in this neighbourhood a white Rook and a white Wood Pigeon ; this bird, which has been about for two years, is marked on the back and wings with a sandy colour. I saw in the summer a white Swallow and a pied Hedgesparrow. A white Tufted Duck was seen twice on a pond here, and there have been several pied Sparrows about. I think it is worthy of note that so many abnormally coloured birds should have been observed in so short a time as six months within a mile of this house. During the last few months I have also been fortunate in obtaining specimens of birds in abnormal plumage, and I think the following are worth mentioning :—Albinos of the Blackbird, Wood Wren, Hedgesparrow, Swallow and Wagtail, pied Whinchat, cream-coloured Yellow Wagtail, one pied and two smoke-coloured Chaffinches, a cream-coloured and a white Thrush, one sandy-coloured and two cream-coloured Larks, two pied Corn Buntings, an albino Flycatcher, an albino Jay (shot by myself near here), a light brown Blackbird, a Yellowhammer with white bars on wing, a sandy-coloured Waterhen, two pied Swifts, one pied Swallow, one albino and several pied Sparrows, and a sandy-coloured Starling.—J. WHITAKER (Rainworth Lodge, near Mansfield).

DIPPER NESTING IN NORTH OXFORDSHIRE.—An innkeeper in this town has in his possession a Dipper's nest, together with the old birds and two eggs. The nest was taken on the banks of the Cherwell, near Claydon, in the north of this county, in the month of May, six years ago. He says that the male bird was shot by a man who, not contented with that, afterwards watched the hen to the nest and caught her alive. When brought to him the nest was surrounded and partly covered with growing vegetation—reeds, moss and grass—some of which seemed as though planted on the sides and dome. It contained four eggs, and was built close to the water (the lower

part indeed touching it), in the stump of one of the small old thorn bushes which grow commonly along our streams. The occurrence seems the more strange because (as you pointed out in 'The Zoologist' for last month with regard to the eastern and southern streams generally) our streams are *generally* sluggish, and have rather low earthy or muddy banks, never approaching a *rocky* bank. The nest was preserved in the stump as it was found, and this is the only instance I know of the Dipper breeding in North Oxfordshire.—
OLIVER V. APLIN (Banbury, Oxon).

A MELANISM OF THE REDWING.—On the 1st January, 1881, a curious variety of the Redwing was caught by a man netting birds at Beeston, near Nottingham. The plumage is as follows:—Head and back dark chocolate-colour; tail dark hazel, with a slight tinge of grey-blue near the ends of the two outer feathers; wings light brown on the outer sides of the flight feathers, and blackish brown on the inside, the first being of a slaty-blue, the last four the same colour, and also some of the feathers on the shoulder, the outside ones of which have black edges to them; the breast dark chocolate, with black and yellow markings. This bird I have shown to Prof. Newton, Messrs. Dresser, Borrer, and Sharpe, also to Mr. Tindall, of Knapton Hall, Yorkshire (who thinks it is the young of the Blue Thrush). Messrs. Dresser and Sharpe consider it to be melanism of the Redwing.—J. WHITAKER (Rainworth Lodge, Mansfield).

UNCOMMON BIRDS IN THE ORWELL.—On the 6th September last a Cormorant was seen in the water near Pin Mill, but although fired at and badly wounded managed to escape. On the 7th October three Eider Ducks were seen near Levington Creek, two of which were shot, and the third obtained near Harwich on the following day. All three were in immature plumage. An indifferent specimen of the female Long-tailed Duck was shot in the Bathing-place Creek, quite close to Ipswich, on the 25th October, and on the 24th November, during a gale from the south-east, another Long-tailed Duck was shot in the same creek. This was also a female, but a much better specimen than the one first obtained.—J. H. H. KNIGHTS (Ipswich).

LITTLE CRAKE IN IRELAND.—Mr. A. G. More states (p. 114), that no occurrence is known of the Little Crake in Ireland. I may mention that there is a specimen of this bird in the collection of Canon Tristram, which was killed at Balbriggan, and which I have had the pleasure of seeing many times, and about the correct identification of which there is no doubt. There is a record of it in 'The Zoologist' for 1854 (p. 4298.)—J. H. GURNEY JUN. (Northrepps, Norwich).

FALCONRY IN WALES.—In answer to the remarks of Mr. F. H. Salvin (p. 117), I beg to assure him that I knew Morgan Williams well. He has

been dead more than ten years, aged over seventy, and therefore must have been over forty years of age when he was a pupil of J. C. Belany. I always understood him to say that he flew hawks when quite a young man, and it was probably to acquire the higher branches of the craft that he became the pupil of J. C. Belany. I could give Mr. Salvin stronger proof if needed, but I think I have said enough to show that I have made no mistake, and I still must consider Morgan Williams as "one of the last of his race."—E. CAMBRIDGE PHILLIPS (Brecon, S. Wales).

NEWTS IN THE TADPOLE STAGE IN WINTER.—I should be glad to know if it is not an unusual circumstance for the Common Smooth Newt, *L. punctatus*, to pass the winter in the tadpole state. I found several of these tadpoles in a pond here at the latter end of February, in various stages of development; some having the limbs in a rudimentary state, others with those organs nearly perfect; they all retained their branchiæ in a more or less complete state. Out of several which I kept in a glass vessel there are a few with the branchiæ still remaining, but in most cases they very soon became absorbed, the growth and development of the limbs being proportionately rapid. I found during the previous winter a perfectly developed Newt of the same species, hibernating under a stone, close to this pond, the size of which was so extremely small that the above-mentioned tadpoles were at least three times as large. They must I think have been very late hatched individuals. This species seems to be liable to considerable variation as regards colour and markings, this being the most observable in the females; some of the difference may, however, be owing to the recent casting of the skin or the reverse.—G. T. ROPE (Blaxhall, Suffolk).

THE BLACK FISH (*Centrolophus pomphilus*) IN THE COLNE.—In the March number of 'The Annals and Magazine of Natural History' (p. 204), Dr. Günther, in noticing the occurrence of this fish at the mouth of the Colne in November last (as recorded by Dr. Laver in 'The Zoologist' for February, p. 75), remarks that "the majority of British specimens of this fish have been obtained on the coast of Cornwall, and so far as he is aware this is the first instance known of the fish having wandered *so far eastwards*." It may be well therefore to note that in Day's 'Fishes of Great Britain and Ireland' (part ii., p. 113), instances are recorded of the occurrence of this fish at Lossiemouth, Elginshire; on the Northumberland coast; and at Redcar, on the Yorkshire coast. The occurrence of the last-named specimen was recorded at page 3504 of 'The Zoologist' for 1852.—J. E. HARTING.

DO SALMON SPAWN IN THE SEA?—Rondeletius and also Gesner, who wrote upon the Salmon upwards of three and a quarter centuries ago, were both upholders of the doctrine that Salmon spawned in the sea, which, were it believed in and acted upon, would be disastrous to our Salmon fisheries, as it might be advanced that these fishes could as well breed in the ocean as in rivers; consequently on their behalf no necessity arises for keeping our fresh waters pure, or having free passes in our streams in order to allow them to reach their spawning-beds. It was probably from such views sprang the notion of the parr being a distinct fish, and even now there are some who doubt whether all our last-springs are the young of *Salmo salar*. Willughby, in his 'History of Fishes,' published in 1686, lib. iv., adduces his reasons for disputing the correctness of Rondeletius's and Gesner's opinions; while Pontopiddan, in 1755, in his 'Natural History of Norway,' returns to Gesner's views, which are now again brought forward as novel. Pontopiddan observed that "the Salmon unquestionably breeds in the sea, though it is not entirely to be denied but that they may sometimes breed in rivers also, for they are found in the midst of Germany and the upper parts of the Rhine, about Basel; but we are well assured that the Salmon chiefly ejects its roe at the mouths of rivers, where they empty themselves into the sea, or a little beyond in the salt water, in this manner: they bend themselves crooked in order to eject the roe at an aperture under the belly, and in the meantime they stick their heads down in the sand that they may have the more strength. The male comes presently after to keep off other fish from devouring the roe, and he then bends his head towards the tail and ejects his sperm upon the roe" (pp. 131, 132). A correspondent of 'Land and Water,' May 28th, 1881, observed, "I also took a samlet last month which was assuming the smolt dress, the ripe milt from which exuded on my fingers—a circumstance common in the autumn, but which has never previously come under my observation in a spring smolt." Probably almost every healthy male parr, when assuming its smolt dress in the autumn, has either ejected its milt in the river, or it is still present at the time he is migrating into the sea. Salmon ova can be fertilised from the milt of a parr, as observed by Willughby and proved by Shaw, while, should a flood carry down these fishes to the sea, it does not seem a very unlikely occurrence that if captured their milt or roe might be still not ejected. Irrespective of this Buckland and others have observed that should this state of the rivers be such—due to pollutions or insufficiency of water—that *Salmonidae* are unable to ascend they may drop or deposit their ova in the sea or at the mouths of rivers; but suppose it is thus deposited, "experiments have proved that the presence of salt-water is fatal to the development into life of the fertilising property of the milt, as also of the impregnated egg, if it come in contact with it."—FRANCIS DAY (Pittville, Cheltenham).

THE CHIRP OF THE CRICKET.—The rate of the Cricket's chirp varies with the temperature, becoming faster as the latter rises. A writer in the 'Salem Gazette' (Mass.), has given the following rule for estimating the temperature of the air by the number of chirps made by Crickets per minute:—"Take seventy-two as the number of strokes per minute at 60° temperature, and for every four strokes more add 1°; for every four strokes less deduct the same." In a letter to the 'Popular Science Monthly,' Margarete W. Brook gives an account of observations she made, with a view to testing this rule, on twelve evenings, from September 30th to October 17th. Her column of temperature, as computed by the rate of vibration, shows a close agreement with that of temperatures recorded by the thermometer.

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

ZOOLOGICAL SOCIETY OF LONDON.

February 21, 1882.—Prof. W. H. FLOWER, F.R.S., President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of January, 1882, and called special attention to a young male Gayal, born in the Gardens, January 6th, being the produce of the fine pair received in exchange in October, 1880, from the Zoological Gardens, Calcutta; and to a young female Markhoor, *Capra megaceros*, from Afghanistan, presented by Lieut.-Colonel Oliver B. C. St. John.

Mr. F. Moore read a paper containing an account of the Lepidoptera collected by the Rev. J. H. Hocking, chiefly in the Kangra District N.W. Himalaya, with descriptions of new genera and species.

A communication was read from Mr. G. A. Boulenger, in which he gave the description of a Frog, *Phyllomedusa hypochondialis*, lately living in the Society's Gardens. This Frog has been obtained at Pernambuco, and was believed to be the first example of the species that had reached Europe alive. Attention was drawn to the peculiar coloration as being worthy of notice, it not having been described before.

Mr. Oldfield Thomas read a paper containing the descriptions of a small collection of Rodents which had been obtained by the late Mr. C. J. Andersson in Damara Land and in the neighbouring countries. The collection contained examples of a new species of Mouse, which was proposed to be named *Mus nigricauda*.

Mr. W. A. Forbes gave a description of the pterylosis of *Mesites*, and

made some remarks on the position of that genus, which he considered to be most nearly allied to *Rhinochetes* and *Eurypyga*, though all these three forms should be referred to different families.

Prof. St. George Mivart read a series of notes on the anatomy of the Canada Porcupine, *Erithizon dorsatus*.

March 7, 1882.—Prof. W. H. FLOWER, LL.D., F.R.S., President, in the chair.

The Secretary exhibited and made remarks on some living examples of *Helix hamastoma* from Ceylon, which had been forwarded to the Society by Mr. J. Wood-Mason.

Mr. W. A. Forbes read a paper on certain points in the anatomy of the Great Anteater, *Myrmecophaga jubata*, as observed in two adult female specimens that had lately died in the Society's Gardens. The arrangement of the ducts of the submaxillary glands and their relations to the stylohyoid muscle, the composition of the anterior cornu of the hyoid bone, the presence of clavicles, and the structure of the brain and of the female reproductive organs were amongst the chief features touched upon.

Capt. G. E. Shelley read an account of the birds collected by Mr. Joseph Thomson while engaged on an exploration of the River Rovuma, East Africa. The collection contained examples of forty-three species of birds, among them being two new species, proposed to be called *Merops Dresseri* and *Erythrocercus Thomsoni*.

A second paper by Capt. Shelley gives an account of a series of birds recently collected by Sir John Kirk in Eastern Africa. This collection was made chiefly in the neighbourhood of Mambois, on the eastern slopes of the mountain range which separates Ugogo from the Zanzibar province.

March 21, 1882.—Prof. W. H. FLOWER, LL.D., F.R.S., President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of February, 1882, and called special attention to four Warty-faced Honey-eaters, *Xanthomyza phrygia*, and two Musk Ducks, *Biziura lobata*, purchased February 8th; also to a young Tapir, born in the Gardens February 12th, and thriving well; and to a female Mule-deer, *Cervus macrotis*, from the Western United States, presented by Dr. J. D. Caton, and received February 15th.

Mr. J. E. Harting exhibited and made remarks on a mummified bird of the genus *Sula*, and some eggs from the guano deposit of an island off the Pacific coast of South America.

Mr. Sclater made some remarks on "lipotypes," a new term which he considered convenient in order to designate types of life the absence of

which are characteristic of a particular district or region. Thus *Cervus* and *Ursus* were "liotypes" of the Æthiopian Region.

Dr. A. Günther exhibited and made remarks on the skin of a pale variety of the Leopard from the Transvaal.

Dr. Günther also exhibited and remarked upon a specimen of a new Turtle (*Geomyda*) from Siam.

Mr. R. Bowdler Sharpe exhibited a specimen of a Goldfinch from Hungary, sent to him by Dr. J. von Madarasz, of the Museum of Budapest, which that gentleman had described as *Carduelis elegans-albigularis*. Mr. Sharpe observed that a white-throated variety of the Goldfinch was by no means unknown in England.

Dr. Hans Gadow read a paper on some points in the anatomy of *Pterocles*, with remarks on its systematic position. Detailed descriptions of the alimentary organs and of the muscles were given. The author took the opportunity of discussing the classificatory or systematic value of the cæca in birds. Then, after pointing out the difficulty of placing the Sand Grouse in the Avian system, he came to the conclusion that the *Pterocetes* (Slater) should be considered as a group co-ordinate to the *Rasores*, *Columba*, and *Limicola*, between which they formed a connecting link.

Mr. W. A. Forbes read a note on a peculiarity of the trachea of the Twelve-wired Bird-of-Paradise, *Seleneides nigra*, as observed in a male specimen that had recently died in the Society's Gardens.

Mr. R. Bowdler Sharpe read a note on the *Strix Oustaleti* of Hartlaub, and pointed out that this bird was none other than the Grass Owl, *Strix candida*.

Capt. G. E. Shelley gave the descriptions of some new species of birds which had been obtained in the neighbourhood of Newcastle, Natal. These the author proposed to name *Anthus Butleri* (a very interesting Yellow-breasted Pipit), *Sphenaeacus natalensis* (the Natal representative of *S. afri-canus*), and *S. intermedius* (an intermediate form from Kaffraria).

Messrs. Godman and Salvin read a paper in which was given the descriptions of some new species of Butterflies of the genus *Agrias*, from the Valley of the Amazons.

Mr. E. J. Miers read an account of a collection of Crustaceans which had been made by M. V. de Robillard at the Mauritius. The author called special attention to a fine Spider Crab dredged up from a depth of eighty fathoms, which he proposed to name *Naia Robilliardi*.—P. L. SCLATER, *Secretary*.

NOTICES OF NEW BOOKS.

Rough Notes on the Birds observed during twenty years shooting and collecting in the British Islands. By E. T. Booth. With plates from drawings by E. Neale, taken from specimens in the Author's possession. 4to, Part I. London : Porter, Tenterden Street ; and Dulau & Co., Soho Square. 1881.

IT may well be supposed, after so many years' personal observation of many of the rarer British birds in their natural haunts, that Mr. Booth must have a considerable store of information on what the late Mr. Timbs would have called "things not generally known."

The public are already indebted to him for the privilege of being able to inspect what is in its way one of the most instructive zoological museums in this country, namely, his own museum of British birds, every one of which has been procured by himself, and preserved and cased under his direction. A printed catalogue, which is placed at the disposal of visitors, gives the names of the species in the different cases, together with the locality where each was obtained ; but something more than this seemed needed. One longed to know under what circumstances some of the rarer species were met with, in what sort of situation, and how obtained ; for their shyness of habit or wariness by nature seemed to indicate that a great deal of trouble and skill must have been expended before they were eventually secured.

As many of them also were tracked to their nesting-haunts, and their eggs and young carefully observed and described in the collector's note-book, it was reasonable to infer that Mr. Booth could clear up sundry disputed points, or rectify, from personal observation, errors into which even authors of repute have been betrayed for want of the opportunities of observation which he has enjoyed.

Fortunately for naturalists there appears to be no difficulty in satisfying their curiosity, for Mr. Booth has kept daily records of his experiences, and a reference to his journal enables him to avoid all such mistakes as might occur from trusting solely to memory.

In the thin quarto now before us we have the first part of a work the merit of which lies in its being entirely original. We have been so long accustomed to refer to standard works of reference, which, though excellent of their kind, are after all but compilations, that it is refreshing to take up a book in which the writer tells us nothing but what he has himself observed, and in most cases noted down on the spot. He commences with the birds of prey, and, in a few pages of transcripts from his journals, gives us more real information about Eagles, Ospreys, and Kites, their haunts, food, changes of plumage, mode of nesting, and so forth, than is contained in any half-dozen books on British birds that might be selected.

About many of the rarer species, and more particularly Eagles, there is a vast amount of misconception prevalent amongst those who have never had the opportunity of observing them in a state of nature. The Golden Eagle, for example, is usually styled "a noble bird," "of majestic flight," disdaining the humbler quarry, or carrion that crows and buzzards delight in; and so forth. But Mr. Booth, from his own observation, has a very different story to tell. Writing of this bird, he says:—

"The Golden Eagle may, without fear of contradiction, I think, be termed essentially a lazy and indolent bird, unwilling or unable to capture for himself any prey that would require much exertion on his part. Hares or rabbits, when surprised in the open, most probably fall easy victims, while lambs or fawns are far too feeble to cause him any great amount of trouble. I cannot call to mind a single instance where I have observed him in pursuit of any winged game that was not partially crippled by shot, while I have noticed scores of times that he has contented himself by making an ignoble meal off some wretched crow or other vermin that was struggling in a trap.

"A keeper in the north related to me the following incident; and, as it helps to illustrate the character of the bird, it may not be out of place:—

"He was on his rounds visiting the traps, when his attention was attracted by an Eagle which was rising a short distance in the air and again dashing down. On carefully approaching the spot (a rough and strong gully, where he was able to obtain a view), he discovered a Wild Cat held by a clam, and the Eagle swooping down, as he imagined, attempting to seize the cat. Every time the bird approached with outstretched talons the cat sprang forward to the fullest extent of its chain, and the Eagle sheared off. Crawling still nearer, he was at last observed, and the bird reluctantly sailed

away to a range of hills above the spot where the encounter had taken place. Making sure that the Eagle would return speedily, he killed the cat and left it as a bait; then, resetting his trap, he threw the rabbit which had been his former bait on one side, and rapidly left the spot. Returning after a few hours, quite confident of finding the Eagle in the trap, he was greatly surprised to discover everything apparently untouched. It was only when he had removed the cat, whose skin he required, and looked out for the bait previously used, that he noticed the rabbit had disappeared from where he had flung it in the morning, and was nowhere to be found. Had he only thought for a moment, it ought to have been clear to him that the Eagle would never have attempted to interfere with the cat (a true Wild Cat is far too rough a customer to be tackled with impunity), and the hungry bird was simply endeavouring to reach the rabbit; even this proceeding the cat most forcibly resisted, and it was not till he returned and found everything quiet that he managed to search out the prey he was originally in quest of and then make off."

With regard to the nesting-haunts of this species, Mr. Booth says:—

"The situations chosen by the Golden Eagle for breeding purposes vary considerably. I have never seen their nests so open and exposed to the storm and wind as those of the Sea Eagle; they appear, in most instances, to seek a more sheltered and hidden position. At times the eyrie may be in the face of a precipitous range of rocks, utterly inaccessible, except to those well acquainted with the use of ropes; but more frequently it requires but little skill to scramble within a few feet of the spot, and, with the assistance of a single line from above, to reach the nest itself. Numbers of ledges showing more or less of the old and weather-beaten nests have been pointed out to me, where, without the slightest help, a very moderate climber might easily make his way to the spot. These localities, with the exception of those in the strictly preserved deer-forests, are now nearly all deserted. I have, however, during the last few years, frequently heard of Eagles taking up their quarters and nesting in districts where their presence formerly, except during an occasional flying visit, was entirely unknown.

"The most curious and striking nest of this species that I ever came across was placed just above a sloping bank that was a perfect bed of primrose-roots. A stunted holly-bush formed a background, and broke the dull appearance of the dark and sombre slab of rock that rose straight from the back of the ledge. The primroses were a mass of bloom, but the holly looked as dried and uncomfortable as if it were struggling for existence in the smoky atmosphere of some London garden.

"It is seldom, I believe, that the nests are now to be found on trees. The old and decaying remnants of the deserted structures may still be

seen, but the tenants have been long evicted. I am aware of but two eyries so placed, which are still used in the Northern Highlands; in both instances a large Scotch fir is the tree resorted to."

The same remarks will not apply to the Osprey, although it seems evident that in the choice of situation for the nest both species are governed very much by circumstances; while changes in the physical aspect of the localities affected by them, whether by the felling or planting timber, or by the various so-called improvements considered necessary by game-preservers, have brought about a consequent change of habit.

On the nesting of the Osprey, Mr. Booth remarks:—

"All the nests now occupied that I have visited during the last few years have been placed on trees, and, without a single exception, the birds had chosen Scotch firs. In two or three cases the nest was placed on the highest branches, which were twisted and growing downwards towards their extremities, giving almost the impression that the growth of the tree had been influenced by the weight of the nest. If the same spot was resorted to for many seasons in succession, such a result might possibly be brought about. In one instance, I believe, the tree has been made use of regularly, while another is only one of several different eyries to which the birds occasionally return, some years taking up their quarters at one spot, and the next changing to another. For the last twenty or thirty years they have never been known to choose an entirely new situation. Within a distance of twelve or fifteen miles nearly a dozen nests in various stages of repair may still be seen; but it is seldom, if ever, that more than a couple of pairs will be found breeding over the whole range. In one instance an immense spreading fir is resorted to (one of the largest and finest trees in the forest); here the nest is placed among the lower branches, at a height of about fifteen feet; it is seldom that I have seen them at a much greater elevation—twenty or twenty-five and (in two instances only) about thirty feet, the latter being the highest I have ever noticed."

These extracts will serve to show the interesting nature of the author's so-called "Rough Notes," as well as to illustrate his style. The species dealt with in this the first part of the work are the Golden Eagle (four plates), the White-tailed Eagle (one plate), the Osprey (one plate), and the Kite (two plates). We learn from the Preface that the work will probably be completed in eight or ten parts, with between sixty and seventy coloured plates drawn by Mr. Edward Neale from subjects in the author's collection.

